

What is claimed is:

1 1. A III-V group nitride system semiconductor substrate,
2 comprising:
3 III-V group nitride system single crystal;
4 wherein
5 said III-V group nitride system semiconductor substrate has
6 a flat surface and satisfies the relationship of $\theta > \alpha$, where
7 θ [deg] is given as an average in angles of the substrate surface
8 to low index surfaces closest to the substrate surface measured
9 at a plurality of arbitrary points in plane of the substrate,
10 and a variation range of said measured angles to θ is
11 represented by $\pm \alpha$ [deg].

1 2. A III-V group nitride system semiconductor substrate,
2 comprising:
3 III-V group nitride system single crystal;
4 wherein
5 said III-V group nitride system semiconductor substrate has
6 a flat surface and a low index surface closest to the substrate
7 surface is inclined to the substrate surface at an arbitrary
8 point in plane of the substrate, the inclination angle has a
9 variation in plane of the substrate, and the inclination
10 direction at an arbitrary point in plane of the substrate is
11 nearly constant.

1 3. A III-V group nitride system semiconductor substrate,
2 comprising:
3 III-V group nitride system single crystal;

4 wherein
5 said III-V group nitride system semiconductor substrate has
6 a flat surface and the normal vector of a low index surface
7 closest to the substrate surface is inclined to a normal line
8 to the substrate surface at an arbitrary point in plane of the
9 substrate, and the direction distribution range of vector
10 projected onto the substrate surface of said normal vector at
11 an arbitrary point in plane of the substrate is less than 180
12 [deg].

1 4. A III-V group nitride system semiconductor substrate,
2 comprising:

3 III-V group nitride system single crystal;

4 wherein

5 said III-V group nitride system semiconductor substrate has
6 a flat surface and satisfies the relationship of $\theta > \alpha$, where
7 θ [deg] is given as an average in angles of the substrate surface
8 to low index surfaces closest to the substrate surface measured
9 at a plurality of arbitrary points in plane of the substrate,
10 and a variation range of said measured angles to θ is
11 represented by $\pm \alpha$ [deg], and the inclination direction at an
12 arbitrary point in plane of the substrate is nearly constant.

1 5. A III-V group nitride system semiconductor substrate,
2 comprising:

3 III-V group nitride system single crystal;

4 wherein

5 said III-V group nitride system semiconductor substrate has
6 a flat surface and satisfies the relationship of $\theta > \alpha$, where

7 θ [deg] is given as an average in angles of the substrate surface
8 to low index surfaces closest to the substrate surface measured
9 at a plurality of arbitrary points in plane of the substrate,
10 and a variation range of said measured angles to θ is
11 represented by $\pm \alpha$ [deg], and the direction distribution range
12 of vector projected onto the substrate surface of the normal
13 vector of low index surfaces closest to the substrate surface
14 at a plurality of arbitrary points in plane of the substrate
15 is less than 180 [deg].

1 6. The III-V group nitride system semiconductor substrate
2 according to claim 1, wherein:
3 said III-V group nitride system single crystal is
4 hetero-epitaxially grown on a hetero-substrate.

1 7. The III-V group nitride system semiconductor substrate
2 according to claim 1, wherein:
3 said III-V group nitride system single crystal composes a
4 self-standing substrate.

1 8. The III-V group nitride system semiconductor substrate
2 according to claim 1, wherein:
3 said III-V group nitride system single crystal is of
4 hexagonal system.

1 9. The III-V group nitride system semiconductor substrate
2 according to claim 1, wherein:
3 said III-V group nitride system single crystal is of
4 hexagonal system and said low index surface closest to the

5 substrate surface is C-face.

1 10. The III-V group nitride system semiconductor substrate
2 according to claim 1, wherein:

3 said III-V group nitride system single crystal is of
4 hexagonal system and said low index surface closest to the
5 substrate surface is A-face, M-face or R-face.

1 11. The III-V group nitride system semiconductor substrate
2 according to claim 1, wherein:

3 said substrate surface is mirror-finished by polishing.

1 12. The III-V group nitride system semiconductor substrate
2 according to claim 1, wherein:

3 said θ is 10 or less [deg].

1 13. The III-V group nitride system semiconductor substrate
2 according to claim 1, wherein:

3 said α is 1.0 or less [deg].

1 14. The III-V group nitride system semiconductor substrate
2 according to claim 1, wherein:

3 said θ is 10 or less [deg] and said α is 1.0 or less [deg].

1 15. The III-V group nitride system semiconductor substrate
2 according to claim 1, wherein:

3 said low index surfaces closest to the substrate surface are
4 C-face and the inclination direction of said low index surfaces
5 to the substrate surface is in A-axis direction.

1 16. The III-V group nitride system semiconductor substrate
2 according to claim 1, wherein:
3 said low index surfaces closest to the substrate surface are
4 C-face and the inclination direction of said low index surfaces
5 to the substrate surface is in M-axis direction.